

united into a disk, which is free in its two posterior thirds. A deep axillary pit.

This new genus is, perhaps, most nearly related to *Evrothrodus*, Gill, which has likewise outwardly directed mandibular teeth, but the dentition of which is otherwise entirely different. The occurrence of a Gobioid fish in mountain streams is a fact of exceptional interest.

*Oreogobius Rosenbergii.*

Depth of body 6 times in total length, length of head 5 to  $5\frac{1}{2}$ . Length of head  $1\frac{1}{2}$  its width, which equals its depth; snout rounded; diameter of eye  $1\frac{2}{3}$  in length of snout,  $1\frac{1}{2}$  in interorbital width, 5 in length of head; mouth extending to below posterior third of eye; interorbital region and occiput flat; head naked; gill-cleft as wide as its distance from its fellow. Dorsal VI, I 10; the space between the two fins equals  $\frac{1}{3}$  or  $\frac{1}{2}$  the base of the anterior; the rays much more elevated in the male than in the female, the longest, in both fins, measuring  $1\frac{2}{3}$  length of head in the former, hardly equalling the length of the head in the latter. Anal I 10, the longest rays measuring  $\frac{3}{4}$  length of head in the male,  $\frac{1}{2}$  in the female. Pectoral rounded, with 20 rays, as long as head. Ventral disk a little broader than long,  $\frac{1}{2}$  length of head. Caudal rounded. A well-developed anal papilla in both sexes. Caudal peduncle compressed, twice as long as deep. 70 to 76 scales in a longitudinal series, 16 or 17 between second dorsal and anal. Dark brown (in spirit), with more or less distinct yellowish cross-bars; each scale with a blackish dot; belly yellowish; first dorsal, anal, and pectoral blackish; second dorsal and caudal greyish, with small light spots.

Total length 113 millim.

Two specimens from Paramba, N.W. Ecuador, 3500 ft. altitude, were obtained by the British Museum from Mr. W. F. Rosenberg.

XIII.—*Revision of British Mollusca.* By the Rev. Canon A. M. NORMAN, M.A., D.C.L., LL.D., F.R.S., &c.

[Continued from ser. 6, vol. vi. p. 341.]

THE part of the Revision which I now publish was written in 1890, but additions have been made in order to bring our knowledge up to the present time. Publication was delayed because I understood that Mr. Edgar A. Smith would continue the publication of the 'Lightning' and

'Porcupine' Mollusca, which Jeffreys, at the time of his death, had carried as far as the Cerithiopsidæ; and I felt it to be desirable to wait, as in case of such publication taking place I should be able to include species there recorded. I now print the following paper, which brings the list of British Mollusca on the descending arrangement as far as the Cerethiopsidæ, which had been reached in Jeffreys's ascending classification. I shall not publish more. Revision of arrangement and nomenclature is very desirable, but the student, from the point to which I have brought him, will be able to complete the list of known British Mollusca with little difficulty if he takes Jeffreys's 'British Conchology' as his base, and adds the species since recorded, including those procured by the 'Porcupine' and other expeditions. The following papers, which I believe to be almost, if not quite complete, containing records of species added to the British fauna, will be perhaps useful for this purpose:—

- (1) JEFFREYS, J. GWYN.—On the 'Valorous' and other Mollusca, in which notes will be found with reference to British species, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. 1876, pp. 251 & 490, vol. xix. 1877, pp. 153, 231, 317.
- (2) NORMAN, A. M.—"On the Occurrence of *Neomenia* (*Solenopus*) in the British Seas," Ann. & Mag. Nat. Hist. ser. 5, vol. iv. p. 164.
- (3) JEFFREYS, J. GWYN.—"The Mollusca procured during the 'Lightning' and 'Porcupine' Expeditions, 1868–70," Proc. Zool. Soc. 1878, p. 393, 1879, p. 533, 1881, pp. 693 & 922, 1882, p. 656, 1883, p. 88, 1884, pp. 111 & 341, 1885, p. 27.
- (4) JEFFREYS, J. GWYN.—"New Species of *Chiton* lately found on the British Coasts," Ann. & Mag. Nat. Hist. ser. 5, vol. vi. 1880, p. 31.
- (5) MURRAY, JOHN.—"Exploration of the Faroe Channel in 1880 by H.M. hired Ship 'Knight Errant,' Proc. Roy. Soc. Edin. 1881–2. The Mollusca by J. GWYN JEFFREYS.
- (6) JEFFREYS, J. GWYN.—"Mollusca of the Cruise of the 'Triton' between the Hebrides and Faroes in 1882," Proc. Zool. Soc. 1883, p. 390; but the only stations from which Mollusca are referred to in this paper, and which are within the British area, are 1, 2, 10, 11, 13, the rest are in the Faroe Channel.
- (7) MARSHALL, J. T.—"On some new British Shells," Journ. Conchol. vol. v. 1886–88, pp. 186 & 278.

- (8) SMITH, EDGAR A.—“Notes on British *Hydrobia*, with a Description of a supposed new Species,” Journ. Conchol. vol. vi. 1889, p. 142.
  - (9) GREEN, Rev. W. S.—“Report of a Deep-Sea Trawling Cruise off the S.W. of Ireland,” Ann. & Mag. Nat. Hist. ser. 6, vol. iv. 1889, p. 409. Mollusca by EDGAR A. SMITH.
  - (10) BOURNE, G. C.—“Report Trawling Cruise in H.M.S. ‘Research’ off the South-west Coast of Ireland,” Journal Marine Biol. Assoc. United Kingdom, new series, vol. i. 1889–90, p. 306. The Mollusca by A. M. NORMAN.
  - (11) GARSTANG, WALTER.—“A complete List of the Opisthobranchiate Mollusca found at Plymouth,” Journ. Marine Biol. Assoc. United Kingdom, new series, vol. i. 1890, p. 399.
  - (12) JORDAN, H. K.—“On the Species and Varieties of the Genus *Fusus* which inhabit the Seas surrounding the British Isles,” Journ. Conchol. vol. vi. 1890, p. 225.
- In this paper species are recorded which have only been dredged in the Faroe Channel, and therefore, I consider, have no claim whatever to be regarded as members of the British fauna. All that is given respecting them is “cold area,” and the number of the station of the expedition in which they were found. Without latitude and longitude it is impossible for the ordinary reader of the paper to know their exact habitat; but a reference to the reports of the ‘Knight Errant’ and ‘Triton’ expeditions will show their habitat to be the Faroe Channel, and therefore they are not noticed in the present paper. The species referred to are the five *Fusi*, *Sabini*, Gray, *delicatus*, Jeffreys, *hirsutus*, Jeffreys, *concinus*, Jeffreys, and *lachesis*, Mörch.
- (13) MARSHALL, J. T.—“Additions to British Mollusca,” Journ. Conchol. vol. vii. 1892–4, pp. 241 & 379, vol. viii. 1895–7, pp. 338 & 385, vol. ix. 1898–9, pp. 61, 120, & 165.
  - (14) CHASTER, G. W., and HEATHCOTE, W. H.—“Contribution to a List of the Marine Mollusca and Brachio-poda of the neighbourhood of Oban,” Journ. Conchol. vol. vii. 1892–4, p. 289.
  - (15) CROUCH (W.).—“*Crepidula fornicata* in Essex,” Proc. Malacol. Soc. vol. i. 1893, p. 19.

Many years ago, when dredging at Salcombe, in Devonshire, I found very numerous dead shells of the American oyster, which had been laid down there, and of *Crepidula*

*fornicata*, which were no doubt living on the oysters when imported, but all seemed to have perished.

(16) CHASTER, G. W.—“*Adeorbis unisulcatus*, new Species from the Irish Coast,” Journ. Conchol. vol. viii. 1895-7, p. 373.

(17) MARSHALL, J. T.—“The Marine Shells of Scilly,” Journ. Conchol. vol. viii. 1895-7, p. 431.

(18) GARSTANG, W.—“On the Gastropod *Colpodaspis pusilla* of Michael Sars,” Proc. Zool. Soc., Nov. 1894, p. 664.

(19) GARSTANG, W.—“The Aplacophorous Amphineura of the British Seas,” Proc. Malacol. Soc. vol. ii. 1896, p. 123.

In this interesting paper, under “Fam. I. Chætodermatidæ,” Mr. Garstang writes: “No British representatives.” *Chætoderma nitidulum* is, however, a member of the British fauna. It was dredged by the German expedition in 37 fathoms in the “Silver pit,” which is to the west of the Dogger Bank, and nearly east of Hull, and was described and figured by Möbius under the name *Crystallophrisson nitens*. See ‘Jahresbericht der Commiss. zur wissenschaft. Unters. der deutschen Meere in Kiel für die Jahre 1872, 1873, 1875,’ p. 157, pl. iii. figs. 6-12.

(20) JORDAN, H. K.—“Some new Species of British Mollusca from the ‘Triton’ Expedition, with a List of other Species new to the Faroe Channel,” Proc. Malacol. Soc. vol. i. 1895, p. 264.

Some of these species I cannot receive, according to my views, as “British;” and the records of localities are most unsatisfactory—“Warm Area” being usually given without any reference to even station, still less to latitude and longitude. Mr. Jordan differs from me as regards the limits of the “British Area,” as he has a perfect right to do. But I trust that naturalists will weigh what I have written on this matter, and examine carefully with charts the conditions of the sea-bottom in the disputed area, together with Sir John Murray’s description of the Wyville Thomson Ridge and its effect upon this fauna in the ‘Knight Errant’ and ‘Triton’ Reports; and then my views will not be misunderstood as they have been by Mr. Jordan. I do not exclude the Faroe Channel only because the water is cold there, but because it geographically belongs to Faroe and not to Britain; and the “Wyville Thomson Ridge” separates two oceans, since it slopes to the south into the Atlantic, with the “warmer area” of that ocean at 500 fathoms, and descends to the north into the Arctic Ocean, with its “cold area” of 500 fathoms.

Superorder *STREPTONEURA*, Spengel.

Order *PECTINIBRANCHIATA*.

Suborder I. *TOXOGLOSSA*.

Fam. 1. *Pleurotomidæ*.

Genus 1. *BELA*, Leach.

1. *Bela pyramidalis* (Ström).

*Bela pyramidalis*, G. O. Sars, Moll. Reg. Arct. Norveg. p. 222, pl. xvi. figs. 3, 4.

*Pleurotoma pyramidalis*, Jeffreys, Ann. & Mag. Nat. Hist. ser. 4, vol. xix. (1878) p. 328.

'Lightning' Expedition, Stat. 13, lat.  $59^{\circ} 5' N.$ , long.  $7^{\circ} 29' W.$ , north of the Hebrides, 189 fathoms (*Jeffreys*).

It is found throughout the Arctic regions of the Atlantic, and descends the American coast as far as Cape Cod. It is also found fossil in the Post-Tertiary deposits and Crag.

2. *Bela cancellata* (Migh.), var. *declivis* (Lovén).

*Fusus cancellatus*, Migh. Proc. Bost. Soc. Nat. Hist. i. (1840) p. 50.

*Defrancia elegans*, Möll. Index Moll. Grœnl. p. 86.

*Tritonium declive*, Lovén, Öfv. k. Vet.-Akad. Förh. 1846, p. 145.

*Bela declivis*, G. O. Sars, Moll. Reg. Arct. Norv. p. 224, pl. xvi. fig. 10.

Taken together with the last species in the 'Lightning' Expedition, and by the 'Porcupine' Expedition, 1869, east of Shetland (Stat. 67), in 64 fathoms. Jeffreys also mentions a var. *angustior* as taken in 1869, Stat. 65, in 345 fathoms; this was to the N.W. of Shetland.

The species occurs on the Norwegian coast not uncommonly, in the Arctic seas, and on the north-east American coast, and was taken by the 'Porcupine,' 1870, on the Channel slope in 567 fathoms south of the British area.

The typical *cancellata* has not yet been found in our seas; the specimens procured belong to the var. *declivis*, Lovén.

3. *Bela cinerea* (Möller).

*Defrancia cinerea*, Möller, l. c. p. 86.

*Bela cinerea*, G. O. Sars, l. c. p. 327, pl. xxiii. fig. 4; Friele, Den Norske Nodhavs-Exped. 1876-8, Mollusca, ii. (1886) p. 9, pl. vii. fig. 23, & pl. x. fig. 6.

*Pleurotoma cinerea*, Jeffreys, Ann. & Mag. Nat. Hist. ser. 4, vol. xix. p. 330.

Dredged by the 'Porcupine,' 1869, Stat. 78, lat.  $60^{\circ} 14' N.$ , long.  $4^{\circ} 3' W.$ , in 290 fathoms, to the east of Shetland.

It is recorded from Greenland, Spetsbergen, Iceland, and Norway.

4. *Bela Trevelyana* (Turton).

This species has been well figured both by Sars and Friele.

5. *Bela tenuicostata* (M. Sars).

*Pleurotoma tenuicostata*, M. Sars, Overs. Vid.-Selsk. Forh. 1868, p. 259.

*Bela tenuicostata*, G. O. Sars, *l. c.* p. 237, pl. xvii. fig. 1; Friele, *l. c.* p. 14, pl. viii. figs. 16, 17, pl. x. fig. 14.

'Porcupine,' 1869, Stat. 23, lat.  $56^{\circ} 7' N.$ , long.  $14^{\circ} 19' W.$ , 630 fath., to the south of Rockall.

This species is common in the Norwegian fiords. It was taken by the Norwegian N.-Atlantic Expedition at seventeen stations in depths 100-1215 fathoms; was dredged by the 'Valorous' in the Atlantic in 1450 fathoms, by the 'Porcupine,' 1870, in the Bay of Biscay, and by Verrill off the coast of New England in 1290 fathoms.

6. *Bela ovalis*, Friele.

*Pleurotoma (Bela) ovalis*, Friele, *Nyt Mag.* xxiii. (1877) p. 9, fig. 5.

*Pleurotoma exigua*, Jeffreys, Report 'Triton' Exped., Proc. Zool. Soc. 1883, p. 399, pl. xlv. fig. 10.

*Bela pygmaea*, Verrill, Trans. Connect. Acad. vol. v. pt. 2 (1882), p. 460, pl. lvii. fig. 8.

*Bela ovalis*, Friele, *l. c.* p. 14, pl. viii. figs. 21, 22, pl. x. fig. 19.

This little species, it will be seen, has been discovered by three expeditions in widely different areas soon after each other. The British locality is on the *Holtenia* ground north-west of the Butt of Lewis; 'Triton' Exped., 1882, St. 13, lat.  $59^{\circ} 51' N.$ , long.  $8^{\circ} 18' W.$ , in 570 fathoms.

It was dredged by the Norwegian Exped. at eight stations in 658-1333 fathoms, and by Verrill off N.E. America in 312-1290 fathoms.

7. *Bela bicarinata* (Couthouy).

*Pleurotoma bicarinata*, Couthouy, Boston Journ. Nat. Hist. ii. 1839, p. 105, pl. i. fig. 11.

*Pleurotoma violacea*, Mighels, Proc. Boston Soc. Nat. Hist. vol. i. 1841, p. 50.

*Defrancia cylindracea*, *livida*, and *Beckii*, Möller, *l. c.* pp. 86, 87.

*Bela bicarinata*, G. O. Sars, *l. c.* p. 237, pl. xvi. figs. 11, 12.

*Bela violacea*, id. *ib.* p. 238, pl. xvii. fig. 2.

*Bela bicarinata*, Friele, *l. c.* p. 15, pl. viii. figs. 18, 19, pl. x. figs. 15, 16.

*Pleurotoma bicarinata*, Jeffreys, Ann. & Mag. Nat. Hist. ser. 4, vol. xix. (1877) p. 325.

'Porcupine,' 1869, to the south of Rockall, St. 23 a, lat. 9\*



56° 13' N., long. 14° 18' W., 420 fathoms; west of Shetland, St. 73, lat. 60° 39' N., long. 3° 9' W., 203 fathoms.

It is found in Norway, generally within the Arctic Circle, in the Gulf of St. Lawrence, and off the N.E. American coast.

#### 8. *Bela exarata* (Möller).

*Defrancia exarata*, Möll. *l. c.* p. 85.

*Tritonium nitrubum*, Lovén, *Æfvers. Vet.-Akad. Förh.* (Index Moll. Scand.) 1846, p. 145.

*Bela exarata*, G. O. Sars, *l. c.* p. 232, pl. xvi. fig. 18.

*Bela nitrubula*, *id. ib.* p. 233, pl. xxiii. fig. 9.

*Bela concinnula*, Verrill, *Trans. Connect. Acad.* vol. v. pt. 2 (1882), p. 468, pl. xliii. fig. 15, and pl. lvii. fig. 11.

*Pleurotoma exarata*, Jeffreys, *Ann. & Mag. Nat. Hist.* ser. 4, vol. xix. (1877) p. 332.

'Porcupine' Expedition, 1869, "164-1230 fathoms off the west of Ireland" (*Jeffreys*), that is, St. 25, lat. 56° 41' N., long. 13° 39' W., near Rockall; and St. 17, lat. 54° 28' N., long. 11° 44' W., to the west of Donegal Bay.

Its distribution is Norway, Arctic Ocean generally, and North-east America. It is fossil in the Crag (*A. Bell*).

#### 9. *Bela turricula* (Montagu).

Jeffreys, in his account of the 'Valorous' Mollusca, writes:—"The sculpture is extremely variable. Having before me a large number of specimens from various parts of the North Atlantic, and after a careful examination and comparison of types of several so-called species, both recent and fossil, I am convinced that the following must be considered synonyms of the present species:—*Defrancia nobilis*, *scalaris*, and *Woodiana* of Möller, *Tritonium roseum* of M. Sars, *Bela americana* of Packard, and *Pleurotoma Dowsoni* and *robusta* of S. V. Wood. *P. harpularia* of Couthouy may be distinct, but it is questionable."

It is therefore doubtful whether any or which of the forms here referred to as synonyms were procured in the 'Porcupine' Expedition.

I am myself inclined to regard *B. scalaris* and *B. nobilis* as forms of *turricula*; and, judging from Searles Wood's figures, *P. Dowsoni* and *robusta* are also referable to it. I would, moreover, include *Bela exarata*, but hesitate as to *B. rosea*, and I doubt if the shell so called by Sars has been found in our seas, though Jeffreys records it from Oban.

*B. turricula* is very variable in sculpture in British seas, but the lattice-work is always less raised than in the Norwegian *B. scalaris* and *nobilis*, though of similar

character. I have remarkably large specimens from the Dogger Bank, one inch in length. Off the coast of Marocco, 'Travailleur' (Locard).

Var. *ecostata*, Norman.

Longitudinal riblets of upper whorls more numerous than in the type, but very small and scarcely raised, while on the body-whorl they are either wholly absent, or in other cases only faintly visible. Dublin Bay (from the late Mr. W. W. Walpole).

10. *Bela rufa* (Montagu), = *Pleurotoma rufa*, Jeffreys.

Var. 1. *lactea*, Jeffr.

Var. 2. *semicostata*, Jeffr.

Var. 3. *Ulideana*, Thompson.

Var. 4. *Cranchii*, Brown.

Var. 5. *angusta*, Jeffr.

Jeffreys states that Sars found this species in Finmark. This is a mistake, as it does not occur in Norway or Finmark; indeed its range is unusually limited. It is not recorded from the Mediterranean.

Genus 2. TYPHLOMANGILIA, G. O. Sars.

1. *Typhlomangilia nivalis* (Lovén).

*Pleurotoma nivalis*, Jeffreys, Brit. Conch. iv. p. 388, v. p. 220, pl. xci. fig. 4.

*Typhlomangilia nivalis*, G. O. Sars, l. c. p. 241, pl. xvii. fig. 6.

Dredged by Dr. Jeffreys and myself off Unst, Shetland, in 120 fathoms, and by the 'Porcupine,' 1869, "N. of Hebrides, in 170 f." \*

I have dredged it frequently in the fiords of West Norway, and Sars has procured it as far north as the Lofoten Islands. It was dredged by the 'Travailleur' in 1882 off the east of Portugal (Locard).

Genus 3. SPIROTROPIS, G. O. Sars.

1. *Spirotropis carinata* (Philippi).

"*Fusus modiolus*, Cristofori & Jan, Cat. 1832, p. 10" (fide Jeffreys).

*Pleurotoma carinatum*, Philippi, Enum. Mollusc. Siciliæ, vol. ii. p. 176, pl. xxvi. fig. 19.

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\* Jeffreys does not give the station, and the exact depth is not recorded for any station. The nearest is Stat. G, 167 fathoms; and if that station is intended, it is not within the British area.



*Pleurotoma carinata*, Jeffreys, Brit. Conchol. vol. v. p. 221, pl. cii. fig. 7.

*Spirotropis carinata*, G. O. Sars, l. c. p. 242, pl. xvii. fig. 5a, b (figura bona).

Dredged by Dr. Jeffreys and myself N.N.W. of Unst, Shetland, in 120 fathoms, living. 'Porcupine,' 1869, "N. of Hebrides, 189 fath." \*

I have dredged it frequently in the Norwegian fiords, and it occurs in the Mediterranean. By the 'Travailleur' it was obtained off the coasts of Spain, Portugal, and Marocco, and as far south as the Canary Islands (*Locard*).

#### Genus 4. DRILLIA, Gray.

##### 1. *Drillia semicolon* (Searles Wood).

*Pleurotoma semicolon* (J. Sow. ?), Searles Wood, Crag Moll., Univalves, p. 54, pl. v. fig. 3.

*Pleurotoma galerita*, Jeffreys, Brit. Conch. v. p. 221, pl. cii. fig. 6.

*Pleurotoma semicolon*, Monterosato, Nuova Revista delle Conch. Medit. 1875, p. 42.

Jeffreys (Brit. Conch. v. p. 221) writes:—"A fresh but dead specimen of *P. galerita*, Ph. (*P. galeritum*, Moll. Sic. ii. p. 172, t. xxvi. fig. 15), was dredged by Carpenter and Thomson in 189 fathoms, about 50 miles N. of the Butt of Lewis. It is a very rare Calabrian fossil." Philippi's figure, however, does not at all resemble that of Jeffreys, and Monterosato writes:—"Il *P. galeritum*, Ph. = *subasperum*, Brugnone, fossile di Calabria e di Sicilia, è differente." Mediterranean, 50-100 fath. (*Jeffreys*, dredgings of Capt. Spratt and Nares).

#### Genus 5. HÆDROPLEURA, Monterosato MSS.

(Bucquoy, Dautzenberg, and G. Dollfus, Moll. Marins du Roussillon, p. 110).

##### 1. *Hædropleura septangularis* (Montagu), = *Pleurotoma septangularis*, Jeffr.

This species, which is operculated, cannot be retained in the same genus with the inoperculated *Mangilia*.

#### Genus 6. MANGILIA, Risso.

##### 1. *Mangilia striolata* (Scacchi).

##### 2. *Mangilia attenuata* (Montagu).

\* This exact depth is not given for any station; probably Stat. 85, 190 fathoms. I have a good living specimen, dredged by the 'Porcupine' and given me by Sir Wyville Thomson.

3. *Mangilia costata* (Donovan).

Var. *coarctata*, Forbes & Hanley.

4. *Mangilia rugulosa* (Philippi).

5. *Mangilia brachystoma* (Philippi).

6. *Mangilia nebula* (Montagu).

Var. 1. *elongata*, Jeffr.

Much larger,  $\frac{3}{4}$  inch long, pale in colour; ribs little raised; spiral striæ faint or absent. Bantry and Shetland (*A. M. N.*).

Var. 2. *laevigata*, Philippi, = *Pleurotoma laevigata*, var. *minor* (Jeffreys).

"Anfractibus planiusculis, contiguïs, lævibus, sub lente tenuissime striatis, superne *obsolete* plicatis; apertura oblonga, tertiam longitudinis partem æquante; cauda brevissima" (*Philippi*). Ribs of last whorl evanescent or absent.

Var. 3. *vittata*, Norman, = *Pleurotoma laevigata*, Jeffreys (partim).

"The space below the suture is girded by a thickened rim, and is always ribless" (*Jeffreys*). Jeffreys's var. *minor* is no doubt the true *laevigata*; but this remarkably fine shell, which he and I took together living between tide-marks at Belgrave Bay, Guernsey, and from which his description of *laevigata* was taken, differs much more widely from the typical *nebula* than do the true *laevigata*. It is like *laevigata* in general character, but attains a large size, .6 inch, and has a marked rounded smooth fillet passing round the summit of each whorl and projected over the preceding one. I have seen nothing like this in Mediterranean *laevigata*, examined from many localities, nor is this fillet described by any other writer.

Var. 4. *lactea*, Jeffreys.

Subgenus 1. PLEUROTOMELLA, Verrill.

7. *Mangilia Packardii*, Verrill.

*Pleurotomella Packardii*, Verrill, Amer. Journ. Sci. v. p. 15 (Dec. 1872); Trans. Conn. Acad. vol. v. p. 453, pl. xliii. fig. 9, pl. lvii. fig. 5, vol. vi. p. 265.

*Defrancia formosa*, Jeffreys, Proc. Zool. Soc. 1883, p. 397, pl. xlv. figs. 9, 9 a, 9 b; Watson, Rep. 'Challenger,' Gast. (1885) p. 349.

*Pleurotomella Saffardi*, Verrill & Smith, Trans. Conn. Acad. vi. (1884), p. 151, pl. xxxi. figs. 4, 4 a.

*Pleurotomella Packardii*, var. *formosa*, Dall, Bull. Mus. Comp. Zool. vol. xviii. (1889) p. 119.

'Porcupine,' 1869, St. 65, lat.  $61^{\circ} 10'$  N., long.  $2^{\circ} 21'$  W., 345 fathoms. 'Triton,' 1882, St. 13, lat.  $59^{\circ} 51'$  N., long.  $5^{\circ} 18'$  W., 570 fathoms, a single specimen (*Jeffreys*). 'Triton,' 1882, St. 11, lat.  $59^{\circ} 30'$  N., long.  $7^{\circ} 13'$  W., 555 fathoms (*Norman*).

It has been found off the east coast of America in 85 to 1608 fathoms; by the 'Porcupine,' 1870, off the Lusitanian coast, in 414–1095 fathoms; by the 'Challenger' off the Azores, 1000 fathoms, off the Canaries in 1125 fathoms, and off Culebra Island, West Indies, in 390 fathoms. A fragment of this species has also been procured by Prof. G. O. Sars in 400 fathoms, Storeggen, off the Norwegian coast.

#### Subgenus 2. *THESBIA*, *Jeffreys*.

#### 8. *Mangilia nana* (*Lovén*).

*Columbella (Thesbia) nana*, *Jeffreys*, Brit. Conchol. vol. iv. p. 359, pl. lxxxvii. fig. 4.

*Jeffreys* placed this species in the genus *Columbella*, which has an operculum, and differs widely from this little species.

Subgenus 3. *TERETIA* (*Teres*, emend.), *Bucq.*, *Dautz.*, & *Dollf.* 1882.

#### 9. *Mangilia anceps* (*Eichwald*).

*Pleurotoma anceps*, *Eichwald*, Naturhist. von Lith. und Volh. (1830), p. 225.

*Pleurotoma teres*, *Forbes* (non *Reeve*), Rep. Ægean Invert. 1844, pp. 139 & 190, and Ann. & Mag. Nat. Hist. vol. xiv. (1844) p. 412, pl. x. fig. 3.

*Defrancia teres*, *Jeffreys*, Brit. Conch. vol. iv. p. 362, pl. xxxviii. fig. 5.

*Raphitoma anceps*, G. O. Sars, l. c. p. 219, pl. xvii. fig. 9.

*Pleurotoma (Teres) anceps*, *Bucq.*, *Dautz.*, & *Dollf.* Moll. Marins du Roussillon, 1883, p. 27 and woodcut.

Subgenus 4. *BELLARDIELLA*, *P. Fischer*, 1883  
(Man. de Conchyl. p. 593).

#### 10. *Mangiliagracilis* (*Montagu*), = *Defranciagracilis*, *Jeffreys*.

I have followed *Fischer's* arrangement in including the foregoing subgenera under *Mangilia*; but the last two can scarcely ultimately remain in that position, the labial sinus of their lip clearly distinguishing them from *Mangilia* proper. I have kept the next genus distinct, as it appears to embrace a natural group.

Genus 7. CLATHURELLA, Carpenter, 1857  
(= *Defrancia*, Millet, 1826, but not of Broun, 1825).

1. *Clathurella linearis* (Montagu), = *Defrancia linearis*, Jeffreys.

Var. *intermedia*, F. & H., = *æqualis*, Jeffr.

2. *Clathurella reticulata* (Renier), = *Defrancia reticulata*, Jeffreys.

Var. *asperima*, F. & H., = var. *formosa*, Jeffr.

3. *Clathurella purpurea* (Montagu), = *Defrancia purpurea*, Jeffreys.

Var. 1. *Philberti*, Michaud.

Var. 2. *La Vix*, Phil., = var. *oblonga*, Jeffr.

4. *Clathurella Leufroyi* (Michaud).

Var. *carnosula*, Jeffr.

## Fam. 2. Cancellariidæ.

### Genus 1. ADMETE, Möller.

1. *Admete viridula* (Fabricius).

*Tritonium viridulum*, Fabricius, Faun. Grœnl. 1780, p. 402.

*Admete viridula*, G. O. Sars, l. c. p. 216, pl. xiii. figs. 1 a, b, 2; Friele, l. c. p. 24, pl. viii. figs. 27-30.

*Cancellaria viridula*, Jeffreys, Ann. & Mag. Nat. Hist. ser. 4, vol. xix. p. 322.

The following locality is within the British area :—  
'Porcupine,' 1869, Stat. 65, lat. 61° 10' N., long. 2° 21' W.,  
345 fath. to the N.W. of Shetland.

*Admete viridula* has a very extensive northern range. It is found in all parts of Arctic Europe, and on the coasts of Norway and the United States; in Behring Strait and N. Japan. It was taken, 'Porcupine,' Stat. 1, 1870, in 567 fath. on the slope of the English Channel.

It is found fossil in the Red and Coralline Crag.

## Suborder II. RHACHIGLOSSA.

### Fam. 1. Fasciolariidæ.

Genus 1. TROSCHELIA, Mörch, 1876  
(= *Boreofusus*, G. O. Sars, 1878).

1. *Troschelia berniciensis* (King).

'Triton,' St. 13, lat. 59° 51' N., long. 8° 18' W., 570 fath.

'Lightning,' St. 13, lat.  $59^{\circ} 5' N.$ , long.  $7^{\circ} 29' W.$ , 189 fath., off Butt of Lewis.

Var. *elegans*, Jeffreys.

Off Shetland, 78-100 fath. (*Jeffreys & Norman*).  
'Porcupine,' 1869, St. 84, lat.  $59^{\circ} 34' N.$ , long.  $6^{\circ} 34' W.$ , 155 fath.

Var. *inflata*, Jeffreys. Spire shorter, whorls more swollen, shell thin and delicate.

'Porcupine,' 1869, St. 74, lat.  $60^{\circ} 39' N.$ , long.  $3^{\circ} 9' W.$ , 203 fath.; St. 78, lat.  $60^{\circ} 14' N.$ , long.  $4^{\circ} 30' W.$ , 290 fath.

The type was taken in the Bay of Biscay by the 'Porcupine' and 'Travailleur' expeditions, and together with the two varieties by the 'Vöringen' expedition. Its range has been extended as far south as coast of Marocco and the Canary Isles by the 'Talisman' (*Locard*).

## Fam. 2. Turbinellidæ.

Genus 1. METZGERIA, Norman, 1878 (= *Meyeria*, Dunker & Metzger, 1878 (nec *Meyeria*, M'Coy, Crust. 1849)).

[*Metzgeria alba* (Jeffreys).]

*Tritonium pusillum*, M. Sars, Overs. Vidensk.-Selsk. Forhand. 1858, p. 39 (name only).

*Latirus albus*, Jeffreys, in Wyville Thomson's Depths of the Sea, 1873, p. 464 (woodcut).

*Lathyrus* and *Meyeria albellus*, Dunker & Metzger, Nach. d. deutsch. malak.-zool. Gesellschaft, 1874, p. 8, and Zool. Ergebnisse der Nord-seefahrt, 1874, pp. 257 & 264 and woodcut.

*Metzgeria alba*, Norman, Mollusca of the Bergen Fiords, Journ. of Conchology, vol. ii. 1879, p. 56.

*Meyeria pusilla*, G. O. Sars, *l. c.* 1878, p. 245, pl. xiii. fig. 8.

In the 'Depths of the Sea' this species is spoken of as "an interesting addition to the already famous Shetland fauna," but under the woodcut is written "Faroe Channel." Unfortunately no station is mentioned, and therefore at present, until Dr. Jeffreys's MS. is published, some doubt must attach to its being found in our area. Jeffreys gave me a fine living example from the dredging of 1869, but unfortunately without station also.

On the West Norwegian coast I have dredged it in Bergen Fiord; off Sartoro, in 15-40 fath.; Solems Fiord, Florø, in 100-250 fath.; and near the mouth of the Hardanger Fiords

in many places, in 50-100 fath. ; and in Stoksund, 125 fath. Dredged as far south as the Azores by the 'Talisman' (Locard).]

Fam. 3. Buccinidæ.

Genus 1. NEPTUNEA, Bolten, 1789.

1. *Neptunea antiqua* (Linn.).

2. *Neptunea despecta*, Linn.

*Murex despectus*, Linn. Syst. Nat. 1222.

*Fusus tornatus*, Gould, Invert. Mass., edit. Binney (1870), p. 374.

*Neptunea despecta*, G. O. Sars, l. c. p. 267, pl. xiv. figs. 4 a-c.

'Porcupine,' 1869, St. 1, off Valentia, Ireland, 110 fath., and between Galway and the 'Porcupine' Bank. Also off South of Ireland (in *Mus. Nor.*).

Its distribution is Christiania Fiord, Western Norway and Finmark, Iceland, Arctic Europe generally, Greenland and N.E. America, Siberia.

It is a most variable species, and *Neptunea antiqua* seems to be its southern form ; and the species becomes keeled more or less, and then nodulous as the *Neptunea* is found under increasing boreal and arctic conditions.

Genus 2. UKKO, Friele (= *Jumala*, Friele).

For this change in the generic name see Norman, "A Month on the Trondhjem Fiord," Ann. & Mag. Nat. Hist. ser. 6, vol. xii., Nov. 1893, p. 352.

1. *Ukko Turtoni* (Bean).

In the paper just referred to I have figured two Norwegian forms of this shell.

Genus 3. VOLUTOPSIS, Mörch.

1. *Volutopsis norvegica* (Chemn.).

Genus 4. SIPHO, Klein.

Subgenus 1. SIPHO (typical).

\* Apex irregular.

1. *Sipho islandicus* (Chemn.).

Long ago Mr. Walpole procured a specimen from off the Wexford coast which is now in the collection of Dr. Mason, of Burton, who purchased Walpole's Mollusca. In 1861 I



dredged two dead examples 40 to 50 miles off the south-eastern coast of Shetland in 78 fathoms. Jeffreys had the more important Mollusca in these expeditions, while I had the animals of other classes, and these two specimens are now in the United States National Museum. It has not been again met with in our seas until the last few years, when specimens have been obtained from fishermen's lines from the west of Dunmore, Co. Waterford. Two of these I procured through Mr. C. Jeffreys, of Tenby. They are living and very fine shells,  $4\frac{3}{4}$  inches long. One when sent off to me was still alive, and when it arrived, though dead, the animal was quite sweet and fresh. 'Porcupine,' 1869, between Galway and the 'Porcupine' Bank. *Sipho islandicus* was dredged by the 'Vöringen' as far north as midway between Beeren Island and Spetsbergen in 123 fath. Its most southern known locality is coast of Marocco, 'Talisman' (*Locard*).

## 2. *Sipho gracilis* (Da Costa).

This species is subject to very considerable variation. Mr. H. Jordan has described ('Journal of Conchology,' vol. vi. 1890, p. 232) three British forms under the names var. *Belliniana*, var. *Coulsoni*, and var. *convoluta*, the first from the coasts of Wexford and Waterford, the second from Shetland (where it is the common form on the "Haaf"), the last from Wick, N.B.; but these varieties can scarcely be recognized by descriptions. Var. *convoluta* has been sent to me by Mr. Jordan from another locality, the Scilly Islands, and I have fine examples of it from the Dogger Bank. The *Sipho glaber* of Verkrusen and Sars (*l. c.* p. 271, pl. xv. fig. 7) is also nothing more than a short variety of *S. gracilis* in which also the spiral sculpture is almost obsolete. The range of the species southwards extends to Marocco, where it was dredged by the 'Talisman' (*Locard*).

## 3. *Sipho turgidulus* (Jeffreys, MS.), Friele.

*Fusus turgidulus* (Jeffr. MS.), Friele, *Nyt Mag. for Naturvidenskab.* 1877, p. 8; Kobelt, *Jahrb. mal. Gesells.* vol. iv. (1877) p. 278, pl. iv. *Neptunea* (*Sipho*) *turgidula*, Friele, *Norske Nordhavs-Exped., Buccinidæ* (1882), p. 11, pl. i. figs. 13-18, pl. iv. figs. 11-28; Kobelt, *Mart. u. Chemn. Conch.-Cab.* ii. p. 110, pl. i. figs. 13-18, pl. iv. figs. 14-28; Kobelt, *Icon. schlenentr. europ. Meeresconch.* vol. i. Heft 3 (1885), p. 74, pl. xi. figs. 4, 5.

In the 'Porcupine' expedition, 1869, it was met with in 155 and 345 fathoms. This gives us St. 84, lat. 59° 34' N.,

long.  $6^{\circ} 34'$  W., and St. 65,  $61^{\circ} 10'$  N., long.  $2^{\circ} 21'$  W.; the first of these is North of the Butt of Lewis, the second N.W. of Shetland.

By the 'Vöringen' it was dredged in 223–649 fath. at six stations, the most northern being lat.  $72^{\circ} 53'$  N., long.  $19^{\circ} 52'$  E. By the 'Travailleur' it was dredged off the coast of Spain (Locard).

Subgenus 2. SIPHONORBIS, Mörch.

\*\* Apex depressed; embryonic whorls gradually diminishing; antigyrus.

4. *Sipho propinquus* (Alder).

'Porcupine,' 1869, N. of Hebrides, 189–530 fath.

5. *Sipho Jeffreysianus* (Fischer).

*Fusus buccinatus*, Jeffreys, B. C. iv. (1868), p. 340 (nec *F. buccinatus*, Lamarek).

*Fusus Jeffreysianus*, Fischer, Journ. de Conchyl. xvi. p. 37; Actes de la Soc. Linn. de Bordeaux, xxviii. (1869) p. 141.

*Fusus Jeffreysianus*, Jeffreys, B. C. v. p. 219, pl. lxxxvi. fig. 4.

Fischer records it from all the S.W. coasts of France, and Locard as taken off the north of Spain by the 'Travailleur.'

6. *Sipho attenuatus* (Jeffreys).

*Fusus attenuatus*, Jeffreys, Proc. Roy. Soc. xviii. no. 121 (1870), p. 434 (name only); Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. (1876) p. 326.

"Shell spindle-shaped, solid, opaque, rather glossy; the periphery is bluntly angled in a half-grown specimen; *sculpture* consisting of numerous spiral impressed lines and of minute close-set and slight lines of growth; *colour* ivory-white; *epidermis* thin and smooth, pale yellowish white; spire long and slender, tapering to a very blunt and regularly spiral point, which is not mamillar or twisted; *whorls* 8–9, compressed, especially below the suture; the last occupies about two thirds of the shell, when viewed with the mouth upwards; the topmost whorls are nearly equal in breadth; *suture* distinct, but not channelled nor deep; it is defined by a thickened edge; *mouth* oblong, acute-angled above, its length, including that of the canal, is about two fifths of the shell; *canal* open, rather long and straight; *outer lip* thin, smooth inside; *inner lip* filmy; *pillar* flexuous; *operculum* ear-shaped, yellowish brown, curved on the outer side and incurved towards the base on the inner side; it is marked with a few slightly impressed lines, which radiate towards the terminal nucleus. L. 2.25. B. 0.85."

'Porcupine,' 1869, St. 28, lat.  $56^{\circ} 44' N.$ , long.  $12^{\circ} 52' W.$ , 1215 fath., which is S.S.E. from Rockall. Jeffreys also gives off West of Ireland, "1180," but there was no dredging at that depth. St. 43, lat.  $50^{\circ} 1' N.$ , long.  $12^{\circ} 26' W.$ , 1207 fath.

It was dredged by the 'Valorous' in the Atlantic on the top of a mountain which was discovered (St. 13, lat.  $56^{\circ} 1' N.$ , long.  $34^{\circ} 42' W.$ ) rising some 4500 feet out of the surrounding abyss, but still covered by 690 fathoms of water.

I have thought it well to give Jeffreys's description because at present there is much uncertainty as regards this shell. Is it the same as G. O. Sars's *Sipho tortuosus*, var. *attenuatus*, who has stated that Jeffreys so regarded it? But later (1883) in 'Triton' Report, Jeffreys writes:—"My *Fusus attenuatus* is not a variety of that species" [*i. e. tortuosus*], but does not state whether he considered it the same as Sars's Finmarkian var. *attenuatus*.

I retain it as doubtfully distinct in consequence of a passage in Friele's Monograph of the 'Vöringen' Buccinidæ, and I put much trust in his judgment.

But first let me state that Friele considers the three forms described and figured by Sars, which include his var. *attenuatus*, to be one species, which is (*Fusus tortuosus*, Reeve, probably) *Tritonium turritum*, M. Sars, = *Sipho tortuosus*, Kobelt and G. O. Sars, = *Chrysodomus turritus*, Dall\*. Sars and Friele have had large series of these shells through their hands, and as they agree their judgment may be regarded as pretty conclusive. Judging from the Finmarkian examples of the three forms which I possess, I also am of the same opinion; and to the synonyms I should be inclined to add as a variety in which the shell is rather wider than usual *Fusus delicatus*, Jeffreys ('Triton' Exped., Proc. Zool. Soc. 1883, p. 396, pl. xlv. fig. 6). Moreover, it may be noted that the *Neptunea attenuata* of Kobelt (Icon. europ. Meeresconchylien, p. 78, pl. xiv. fig. 12) is a copy of Sars's figure of his var. *attenuata*.

Respecting Jeffreys's shell, Friele writes:—"Sars states that Dr. Jeffreys has himself identified the variety *attenuata* (*l. c.* pl. xv. fig. 5) as *Fusus attenuatus*, Jeffreys. I had opportunity of examining this form in Dr. Jeffreys's collection; but *Fusus attenuatus*, it appeared to me, was a species perfectly distinct from *Neptunea turrita*. The canal, I observed, was comparatively more open and straight, and the whorls flatter."

\* In 'Valorous' Report Jeffreys calls *turritus* a variety of *propinquus*; in 'Knight Errant' Report, later, he says "not *F. propinquus*, Alder, var."

It is worthy of notice that even the var. *attenuata* of Sars is subject to considerable difference of contour. My example from Tromsö, received from Herr Schneider, though smaller than that figured by Sars, being just  $1\frac{1}{2}$  inch, has an additional whorl, and is narrower in proportion to its length, thus approaching more in proportion to *S. lachesis*, to which, however, its comparatively flattened whorls and twisted canal show no approach. Locard records this species as taken off the coast of Marocco by the 'Travailleur.'

# 7. *Sipho ebur*, Mörch.

*Fusus* (*Siphonorbis*) *ebur*, Mörch, Journ. d. Conch. (1869), p. 398 \*.

*Trophon Sarsii*, Jeffr., S. Wood, Suppl. Crag Moll. (1872), p. 25, pl. i. fig. 9.

*Fusus Moebii*, Dunker and Metzger, Jahresb. der Comm. zur Unters. der deutschen Meere, 1874, p. 360, pl. vi. fig. 1.

*Neptunea* (*Siphonorbis*) *ebur*, Friele, Norske Nordhavs-Exped., Buccinidæ (1882), p. 18, pl. ii. figs. 20-23, pl. v. figs. 1-3.

*Neptunea ebur*, Kobelt, Icon. europ. Meeresconch. Heft 3 (1885), p. 13, pl. xiii. figs. 5, 6 (copies from Friele).

*Neptunea Sarsii*, Kobelt, l. c. p. 79, pl. xiii. figs. 7, 8 (fig. 8, copy from G. O. Sars).

'Knight Errant,' 1880, Stat. 5, lat.  $59^{\circ} 26'$  N., long.  $7^{\circ} 19'$  W., 515 fathoms, near the *Holtenia* ground, N.W. from the Butt of Lewis.

I have dredged young specimens in the neighbourhood of Lervig in the Hardanger Fiord in 100-210 fathoms, which is, I believe, its present known southern limit in Norway; Kors Fiord, near Bergen, 300 fathoms (*Friele*); and ranging straight up the coasts of Norway and Finmark "to the tract of ocean between Norway and Novaja Zemlja, lat.  $72^{\circ} 31'$  N., long.  $21^{\circ} 51'$  E. (*Friele*)." Coast of Greenland (*Mörch*).

Fossil in the Crag (*Searles Wood*).

# 8. *Sipho fusiformis* (Broderip).

*Buccinum fusiforme*, Broderip, Zool. Journ. v. p. 45, pl. iii. fig. 3.

*Fusus fenestratus*, Turton, Mag. Nat. Hist. vii. p. 391; Jeffreys, B. C. iii. p. 343.

One of the original British specimens procured by Humphreys from fish-stomachs at Cork, which was in Walpole's collection and passed thence to that of Dr. Mason, was kindly given me by the latter. 'Porcupine,' 1869, off the mouth of the Shannon, Ireland, 90 fathoms (St. 6); 'Flying-Fox,' 1889, 110 fathoms, off the south coast of Ireland, a very fine specimen 52 mm. in length (*E. A. Smith*).

\* This was disputed by Jeffreys, but Friele has compared types, for observations on which see his paper.

*F. fenestratus* generally occurs in 100–200 fathoms, and is found throughout Norway, where I have dredged it fine and living in two places near the mouth of the Hardanger Fiord in 80–120 fathoms. Friele records it in the ocean as far north as lat. 72° 27' N., long. 20° 51' E. Jeffreys took it in the 'Valorous' in Davis Strait, 410 fathoms (the greatest depth recorded for the species), and mentions its occurrence in the Bay of Biscay, where E. A. Smith, on authority of Jeffreys's MSS., states that it was dredged by the 'Travailleur' in 277 to 731 fathoms, also off coast of Marocco (*Locard*).

Genus 5. *LIOMESUS*, Stimpson, 1865  
(= *Buccinopsis*, Jeffreys, 1863; *non* Conrad, 1857,  
*nec* Deshayes, 1865).

1. *Liomesus Dalei* (J. Sow.).

To the west of St. Kilda, 100 fathoms (*Hoyle*).

2. *Liomesus* (?) *striatus* (Jeffreys).

*Buccinopsis striata*, Jeffreys, in Wyville Thomson's 'Depths of the Sea,' p. 462, and woodcut p. 364.

This remarkable-looking shell is stated to be "another interesting addition to the already famous Shetland fauna," but no station or depth is given. Its retention in this genus is very problematical.

Genus 6. *BUCCINUM*, Linné.

1. *Buccinum undatum*, Linn.

I have found the true *Buccinum undatum* as far north-east as Vadsö, on the Varanger Fiord. There it occurs between tide-marks, and near at hand, in similar position, *B. grænladicum*; while at another part, all within a range of less than half a mile, there occurs in abundance a *Buccinum*, which is, I believe, unknown elsewhere, and is so intermediate between these two species, that it is difficult to say to which it should be referred. In size it resembles more nearly the latter; but many of the specimens have sculpturing closely analogous to that of the former. It is possibly a hybrid. It has been named *B. parvulum*, Verkrusen. Another northern form of this species is *B. Schneideri*, Verkrusen, a very pretty milk-white form from deep water off Vardö, where it lives in company with *B. perditæ*, Mörch (= *B. finmarchianum*, Sars).

2. *Buccinum Humphreysianum*, Bennett.

'Porcupine,' 1869, St. 1, off Valentia, 110 fathoms.

'Porcupine,' 1870, and 'Travailleur,' Bay of Biscay (*Jeffreys*); Norwegian coast, where I have dredged it at the entrance of Fane Fiord near Bergen, and at Florö in 47-70 fathoms.

Genus 7. *DONOVANIA*, Bucq., Dautz., & Dollf.

(= *Lachesis*, Risso, 1826 (preoccupied)).

*Donovania minima*, Bucq., Dautz., & Dollf, Mollusques Marins du Roussillon, 1883, p. 112, pl. xv. figs. 26-30.

*Donovania minima*, Martin T. Woodward, Some Account of the Synonymy and Affinities of *Donovania minima*, Proc. Malacol. Soc. vol. iii. 1899, p. 235.

1. *Donovania minima* (Mont.).

Var. *pallida*, Jeffr.

Var. *alba*, Jeffr.

I have arranged this genus here in consequence of Mr. M. T. Woodward's paper on the animal and radula, which he has just published.

Fam. 4. *Nassidæ*.

Genus 1. *NASSA*, Lamarck.

1. *Nassa reticulata* (Linn.).

Var. *nitida*, Jeffreys, = *Nassa nitida*, Jeffreys, B. C. iv. p. 399.

2. *Nassa incrassata* (Ström).

3. *Nassa pygmaea*, Lamarck.

Fam. 5. *Columbellidæ*.

Genus 1. *ASTYRIS*, H. & A. Adams.

[*Astyris rosacea* (Gould).]

*Buccinum rosaceum*, Gould, Silliman's Journal, xxxviii. (1840) p. 197.

*Mangelia Hobölli* (Beck), Möller, Ind. Moll. Grönl., Nat. Tidssk. iv. 1842, p. 85.

*Buccinum Holbölli*, Waller, Mollusca Antrim Coast, Journ. Roy. Dubl. Soc. ii. (1858) p. 30, pl. i. fig. 1 a-b.

*Columbella rosea*, Gould, Invert. Mass., edit. Binney, 1870, p. 357.

*Pyrene rosacea*, G. O. Sars, l. c. p. 251, pl. xvi. fig. 1.

"N. of Hebrides, 170 fath., C. & T." (Brit. Couch. v. p. 219). This must refer to the 'Lightning' Exped. St. 9, Ann. & Mag. N. Hist. Ser. 7. Vol. iv. 10



which is lat.  $60^{\circ} 24' N.$ , long.  $6^{\circ} 38' W.$ , and beyond the British area. It has been dredged, but fossil, on the Turbot Bank, Co. Antrim, by Waller and others; in the Minch by Jeffreys and myself; and off the coast of Aberdeenshire by Mr. R. Dawson.

It is found living on the western and northern coasts of Norway; on the former I have dredged it in the Bergen and Hardanger Fiords, Spetsbergen, Greenland, N.E. coast of N. America, and Alaska. Fossil in the Upper Glacial deposits.]

## Genus 2. ANACHIS, H. & A. Adams.

### 1. *Anachis haliæti*, Jeffreys.

*Columbella haliæti*, Jeffreys, B. C. iv. p. 356.

*Pyrene costulata*, G. O. Sars, l. c. p. 252, pl. xxiii. fig. 16; Jeffreys, 'Knight Errant,' Proc. Roy. Soc. Edinb. 1882, p. 46.—Nec *Fusus costulatus*, Cantraine, vide Jeffreys, 'Triton,' Proc. Zool. Soc. 1883, p. 392.

*Anachis haliæti*, Dall, Bull. Mus. Comp. Zool. xviii. 1889, p. 188.

Dredged by Jeffreys and myself about 25 miles N.N.W. of Unst, in 85–95 fathoms, together with a var. *albula* (vide B. C. v. p. 219). 'Lightning,' 1868, St. 14, lat.  $59^{\circ} 59' N.$ , long.  $9^{\circ} 15' W.$ , 650 fathoms; 'Porcupine,' 1869, between Galway and the Porcupine Bank; 'Knight Errant,' 1880, St. 7, lat.  $59^{\circ} 37' N.$ , long.  $7^{\circ} 19' W.$ , 530 fathoms; 'Triton,' 1882, St. 13, lat.  $59^{\circ} 31' N.$ , long.  $8^{\circ} 18' W.$ , 570 fathoms; 'Flying-Fox,' 1889, 1000 fathoms, off the south of Ireland (*E. A. Smith*).

Beyond the British area it was dredged by the 'Porcupine,' 1869, St. 42, lat.  $49^{\circ} 12' N.$ , long.  $12^{\circ} 52' W.$ , 862 fathoms; 1870, in the Mediterranean, 1412 fathoms, where it was also procured by the Italian Expedition in 85–544 fathoms. It occurs also in the Bay of Biscay, 'Porcupine' and 'Travailleur'; among the Lofoten Islands and Finmark (*G. O. Sars*), and off the N.E. coast of America, 48–1537 fathoms (*Verrill*).

## Fam. 6. Muricidæ.

### Genus 1. OCINEBRA, Gray.

*Ocinebra* differs from *Murex* in its radula and its operculum.

#### 1. *Ocinebra erinacea* (Linn.), = *Murex erinaceus*, Jeffr.

Var. *tarentina*, Lamarek.

This is the common form in our seas. It is not a "half-grown" state, as Jeffreys says it is (Brit. Conchol. vol. iv.

p. 310), but a form which has the ribs much less strongly developed than more southern specimens.

Var. *tetragona*, J. Sow.

*Purpura tetragona*, Searles Wood, Crag Moll 1848, p. 38, pl. iv. fig. 7 a-d.

In the 'Annals,' 1883, a controversy will be found between Jeffreys and Searles Wood, the former maintaining that this shell was a *Purpura*, the latter that it was a variety of *Ocenebra erinacea*. Searles Wood kindly sent me some of his specimens of this form from Felixstowe, and it appears to me that he was beyond question right in transferring them to this genus.

Var. *melanostoma*, Jeffreys, B. C. iv. p. 218.

Black-mouthed, Jersey (*Dodd*).

What Jeffreys calls var. *sculpta*, B. C. iv. p. 308, I judge, from the description, to be what I consider the type of the species. A remarkable variety which is found further south, but has not yet occurred on our coasts, is the *Murex torosus*, Lamarck.

2. *Ocenebra aciculata* (Lamarck), = *Murex aciculatus*, Jeffr.

In the Channel Islands specimens attain much larger dimensions than any I have seen from the Mediterranean or Madeira.

A genus has been made for this shell, *Ocenebrina*, Jousseaume, 1880, = *Corallinia*, Bucquoy and Dautzenberg, 1882; but it is at most a section of *Ocenebra*.

Genus 2. *Trophon*, Montfort.

1. *Trophon muricatus* (Mont.).

Var. *lactea*, Jeffr.

This variety was dredged by Jeffreys and myself in Hurds Deep, near Guernsey, in 60 fath. I have not seen it from any other locality.

2. *Trophon barvicensis*, Johnston.

I have collected this in many localities on the west coast of Norway; but all the specimens thence are much inferior in size to those from our own seas. Its range has been extended southwards to the coast of Marocco by the 'Travailleur' (*Locard*).

3. *Trophon truncatus* (Ström).

Var. *scalaris*.

This variety, though similar in character, must

not be confounded with var. *Gunneri* of the following species.

Jeffreys (B.C.iv.p. 321) points out the distinctions between this and *T. clathratus*, but in his subsequent papers he united them. It was taken in the 'Lightning' expedition in 530 fath. (St. 12).

[*Trophon clathratus* (Linn.).

Jeffreys, in his account of 'Valorous' Mollusca (Ann. & Mag. Nat. Hist. ser. 4, vol. xix. 1877, p. 325), gives 'Porcupine' Expedition, 1869, off the Hebrides, 165-580 fath. No station has the exact depth of 165, but St. 60 is 167 fath., and 580 fath. is the depth of St. 59; but neither of these two stations is within the British area.]

#### 4. *Trophon carinatus*, Jeffreys.

*Trophon carinatus*, Jeffreys, Mollusca of 'Triton,' Proc. Zool. Soc. 1883, p. 395, pl. xliv. fig. 5.

A fragment thus named, with the following description:—  
"Shell distinguishable from *T. clathratus* in having a prominent keel in the middle of each whorl; the laminar ribs are fewer and obtusely angulated; the spiral striæ, which cover the interstices of the ribs, are numerous, regular, comparatively strong, and flexuous or curved; colour white; inner lip glazed and lustrous. L. (if perfect) 0·6. B. 0·25."

St. 13, lat. 59° 51' N., long. 8° 18' W., 570 fath.

This may, I think, prove to be the *T. lacunellus* of Dall, 'Blake' Mollusca (Bull. Mus. Comp. Zool. xviii. 1889, p. 205, pl. xv. fig. 4), or *T. aculeatus*, Watson, 'Challenger.'

### Genus 3. PURPURA, Bruguière.

#### 1. *Purpura lapillus* (Linn.).

Var. 1. *imbricata*, Lamk.

I am indebted to the kindness of Mrs. Stebbing for a reversed monstrosity of *P. lapillus* found by her living on the North Wales coast.

[*Purpura hæmastoma* (Linn.), Jeffr. B. C. iv. p. 283.

I am not aware that the occurrence of this species at Guernsey has been confirmed. It may reasonably be expected there, as it occurs on the opposite coast of France (*P. Fischer*).]

Suborder III. TÆNIOGLOSSA.

Fam. 1. Tritonidæ.

Genus 1. TRITON, Montfort, 1810  
(= *Tritonium*, Cuvier).

1. *Triton nodifer*, Lamarck.
2. *Triton cutaceus* (Linn.).

Fam. 2. Cassididæ.

Genus 1. CASSIDARIA, Lamarck, 1812.

1. *Cassidaria rugosa* (Linn.).

*Buccinum rugosum*, Linn. Mantissa (1771), p. 549.

*Buccinum tyrrhenum*, Chemnitz, Conch.-Cab. (1788), vol. x. p. 192,  
pl. cliii. figs. 1461, 1462.

*Cassidaria depressa*, Philippi, Moll. Sic. vol. ii. (1844), p. 186, pl. xxvii.  
fig. 3, *varietas*.

*Cassidaria rugosa*, Hidalgo, Moluscos de España &c., 1870-82, pl. .  
fig. 1.

*Cassidaria tyrrhena*, Bucquoy, Dautzenberg, and Dollfus, Mollusques du  
Roussillon, fasc. ii. (1882) pl. ix. fig. 3.

This species was first recorded as a member of our fauna by Mr. G. C. Bourne, who procured two specimens (one of which preserved with the animal in spirits is in my collection) in a trawling-cruise of H.M.S. 'Research' off the south-west of Ireland, lat. 50° 29' 26'' N., long. 11° 4' W., in 400 fath. In the trawl with it were the fish *Haloporphyrus eques*; the Echinoderms *Spatangus purpureus*, *Echinus norvegicus*, and *Nymphaster subspinosus*; the Crustacea *Bathynectes superbus*, *Ebalia nux*, *Lispognathus Thomsoni*, *Scyramathea Carpenteri*, *Eupagurus carneus*, and *Parapagurus pilosimanus*; and the Actinozoa *Epizoanthus paguriphilus* and *Actinauge Richardi*; also a living example of another very interesting addition to our molluscan fauna, *Solarium mediterraneum*, Monterosato (see G. C. Bourne, "Report of a Trawling-Cruise in H.M.S. 'Research' off the South-west of Ireland," Journ. Marine Biol. Assoc. United Kingdom, new series, vol. i. 1889-90, p. 306). *Cassidaria rugosa* has been since several times recorded off the same part of Ireland (see Marshall, Journ. Conchol. vol. vii. p. 380).

*Distribution.* Mediterranean, common. In the Atlantic it has been taken at Guetaria (*Hidalgo*), Cadiz (*Paz*), Bay of Biscay, 'Porcupine' and 'Travailleur' (*Jeffreys*), Belle Ile, Hoedic, and Croisic (*Cailliaud*), off Marocco, 'Talisman' (*Locard*).

This would certainly seem to be the *Buccinum rugosum*, Linn. (nec Gmelin). Hidalgo, in support of this view, draws special attention to the words italicized in the following description of Linné:—"Testa magnitudine ovi, *alba*, striis transversis, *elevatis*, numerosissimis, confertissimis: quarum *sexta* (a sutura spirali) *crassior*, tuberculis constituens cingulum. Spira omnino ovata, acuta. Cauda exserta, leviter ascendens. Labrum marginatum, intus inæqualiter tuberculatum. Labium inferius *late* explanatum, *in ipsa fauce inæquale*. *Crypta*, inter testam et labium interius, *profunda*. Bonanni, Recr. 3, fig. 160."

This description seems clearly to apply to the present species and not to a variety of *Cassidaria echinophorus*. For fuller observations on the subject see Hidalgo's work.

### Fam. 3. Cypræidæ.

#### Genus 1. OVULA, Bruguière, 1789.

Subgenus SIMNIA, Leach, 1829.

##### 1. *Ovula patula* (Pennant).

#### Genus 2. CYPRÆA, Linné.

Subgenus TRIVIA, Gray.

##### 1. *Cypræa europæa*, Mont.

#### Genus 3. ERATO, Risso.

##### 1. *Erato lævis* (Donovan).

*Marginella lævis*, Jeffreys, B. C. iv. p. 400, pl. xcii. fig. 1.

### Fam. 4. Aporrhaidæ.

#### Genus 1. APORRHAIIS (Petiver, 1702), Da Costa.

##### 1. *Aporrhais pes-pelecani* (Linn.).

##### 2. *Aporrhais serresianus* (Michaud).

*Rostellaria serresiana*, Michaud, Bull. Soc. Linn. Bord. ii. 1828, p. 120, pl. i. figs. 3, 4.

*Chemypus serresianus*, Philippi, Enum. Moll. Sic. ii. (1844) p. 185, pl. xxvii. fig. 6.

*Aporrhais serresianus*, G. O. Sars, l. c. p. 192, pl. xxii. figs. 7 a, b, pl. xiii. fig. 4; Norman, Journal of Conchology, ii. (1879) p. 55.

Var. *McAndrewæ*, Jeffr.

*Aporrhais pes-carbonis* (? Brong.), Forbes & Hanley, Brit. Moll. iii. p. 186, pl. lxxxix. figs. 5, 6.

*Aporrhais Macandrewæ*, Jeffreys, B. C. iv. p. 253, v. pl. lxxx. figs. 1, 2.

'Porcupine,' 1869, Stats. 1, 3, 5, 6, 10, 17, 18, 23 *a*, off W. of Ireland, to 1435 fath.; 65, 68, 70, East and West of Shetland; 45 *a*, 45 *b*, S.W. of Ireland, 458 fath.

Jeffreys does not state to which variety the specimens procured by the 'Porcupine' belonged, but in 1870 I dredged on Jeffreys's yacht the 'Osprey,' off Valentia, 112 fath., the typical form closely agreeing with those of the Mediterranean. This same form occurs on the coast of Norway, where I have dredged it at the mouth of Fane Fiord, near Bergen, living in 50-120 fathoms.

The form *Macandrewæ*, which alone was found by Barlee, Jeffreys, and myself in the Shetland seas, measures 34 millim., and I have full-grown specimens which do not exceed 24 millim.; the Valentia specimens are 43 millim. There is considerable variation in the length and form of the digitations. In a Naples specimen in my cabinet the upper spike overtops the spire by half its own length, and in Mediterranean examples the posterior spike has often a large bulbous swelling at half its length.

Fam. 5. **Cerithiidæ.**

Genus 1. **CERITHIUM.**

1. *Cerithium procerum*, Jeffreys.

*Cerithium procerum*, Jeffreys, Ann. & Mag. Nat. Hist. ser. 4, vol. xix.

(1877) p. 322, and Proc. Zool. Soc. 1885, p. 53, pl. vi. figs. 2, 2 *a*.

*Cerithium Danielsseni*, Friele, Nyt Mag. for Naturvid. 1877, p. 3.

*Cerithium procerum*, Friele, Jahrbuch deutsch. mal. Gesells. vi. (1879) p. 275.

'Porcupine,' 1869, St. 23 *a*, to the south of Rockall, in 420 fath. 'Lightning,' St. 1, lat. 59° 20' N., long. 7° 5' W., 500 fath., north of Lewis.

*Distribution.* North Atlantic, 'Valorous,' St. 12, 1450 fath.; 'Vöringen,' from 62° 44' N. to Spetsbergen, in 400-1130 fath. (Friele); 'Porcupine,' 1870, St. 22, off Lisbon, 718 fath.; Jeffreys (Proc. Zool. Soc.) also gives "between the Faroes and Hebrides, 'Triton' cruise"; but it is not mentioned in the account of 'Triton' Mollusca, and therefore the locality may have been north of lat. 60° N.



## Genus 2. TRIFORIS, Deshayes.

Subgenus MONOPHORUS, Grillo, 1877 = *Biforina*, B. D. & D. 1884.

1. *Triforis perversa* (Linn.), = *Cerithium perversum*, Jeffreys, B. C. iv. p. 261.

## Genus 3. BITTIUM, Gray.

1. *Bittium reticulatum* (Da Costa), = *Cerithium reticulatum*, Jeffreys, B. C. iv. p. 258.

Genus 4. LOVENELLA, G. O. Sars, 1878  
(= *Cerithiella*, Verrill, 1882).

1. *Lovenella metula* (Lovén), = *Cerithium metula*, Jeffreys, B. C. iv. p. 256.

'Porcupine,' 1869, Stats. 23 a, to the south of Rockall, in 420 fath.; 65 N.E. of Shetland, 345 fath.; 'Knight Errant,' St. 7, 540 fath., to the west of the "Wyville Thomson Ridge;" 'Triton,' St. 10, in the same district as the last.

Its distribution is Spetsbergen (*Friele*); Norway (*A. M. N.* &c.); Finmark (*G. O. Sars*); Bay of Biscay and off coasts of Spain and Portugal, 'Porcupine,' 1870 (*J. G. J.*).

## Genus 5. CERITHIOPSIS, Forbes &amp; Hanley.

1. *Cerithiopsis tubercularis* (Mont.).

Var. *albescens*, Marshall, Journ. of Conchol. vol. vii. (1892-4) p. 259.

Var. *scalaris*, Monterosato, id. ib. p. 259.

Var. *acicula*, Brusina, id. ib. p. 259.

2. *Cerithiopsis Barleei*, Jeffreys.
3. *Cerithiopsis pulchella*, Jeffreys.
4. *Cerithiopsis Metaxæ* (Della Chiaje).
5. *Cerithiopsis costulata* (Möller).

## Genus 5. LÆOCOCHLIS, Metzger &amp; Mayer.

1. *Læocochlis granosa* (S. V. Wood).

*Cerithium granosum*, S. V. Wood, Crag Moll. Palæont. Soc. 1848, p. 73, pl. viii. fig. 9.

*Triforis McAndrei*, H. Adams, Proc. Zool. Soc. 1848, p. 1.

*Triforis nivea*, M. Sars, Chr. Videns.-Selsk. Forhand. 1858, p. 85.

*Læocochlis pommeraniæ*, Dunker & Metzger, Nach. d. deutsch. mal.-zool. Gesellsch. 1874, p. 7, and Nordsee Jahrb. der 'Pommerania,' 1874, pp. 249 & 258, pl. vi. fig. 3, and woodcut p. 264, fig. 3.

*Cerithium granosum*, Wyville Thomson, Depths of the Sea, 1873, p. 463.

*Læocochlis granosa*, G. O. Sars, l. c. p. 190, pl. xiii. fig. 6; Jeffreys, Mollusca of the 'Lightning' and 'Porcupine' Expeditions, Proc. Zool. Soc. 1885, p. 52.

In Wyville Thomson's 'Depths of the Sea,' 1873, p. 463, it is stated: "*Cerithium granosum*, S. V. Wood, is also common to Norway and Shetland;" and I myself have a small dead specimen which was given me by my late friend Mr. E. Waller as from "Shetland;" but Jeffreys does not give a station in his report which is in the Shetland Sea. The following, however, establish its claims to be included in our fauna:—"Porcupine," 1869, St. 23 a, lat.  $56^{\circ} 13' N.$ , long.  $14^{\circ} 18' W.$ , that is, south of Rockall in 420 fathoms; Stations 89 and 90, which were on the '*Holtenia*' ground, N.W. of the Butt of Lewis, lat.  $59^{\circ} 38'$  to  $41'$ , long.  $7^{\circ} 46'$  to  $34' W.$ , in 445 and 458 fathoms.

It was also taken to the north of our area by 'Lightning,' St. 2, and 'Porcupine,' 1869, St. 65. I have myself dredged it in several places on the west of Norway, and Sars has recorded it from Finmark. As a fossil it occurs in the Red and Coralline Crags, and also in the Antwerp Crag.

## BIBLIOGRAPHICAL NOTICES.

*Insects, their Structure and Life. A Primer of Entomology.* By GEORGE H. CARPENTER, B.Sc. Lond. Pp. xi, 404. London, J. M. Dent & Co.

IN this useful little book Mr. Carpenter has given a sketch of the structure of insects in general (the cockroach being taken as a typical example), and an abstract of the classification, structure, habits, and pedigree of insects, not forgetting to add a Bibliography and Index. Although the book does not profess much originality, it is well arranged, and contains a large amount of information which it would require much time and trouble to collect elsewhere, even with the aid of the bibliography which Mr. Carpenter has appended to his work. The non-technical portions (those dealing with habits, evolution, pedigree, &c.) are written in a very clear and pleasing style, and may interest many readers who might not care for the more technical parts of a work on entomology; for the subject is so vast and varied that it presents ample materials for study, equally to the systematist, the comparative anatomist, the field naturalist, the geologist, the philosopher, and the amateur who wishes for as much general superficial knowledge of everything as he can obtain.

It is not to be supposed that a book of such a comprehensive character can be free from error; but although we may not always agree with the author's conclusions, we have not noticed anything which we should be disposed to regard as seriously detracting from its value. The amount of space devoted to different parts of the subject, the reliability and real importance of various observations and experiments, the mutual affinities of different families of insects, the probable number of existing species of insects, and the problems of Evolution and Geographical Distribution are all subjects on which no general consensus of opinion can at present be expected.